

## WA3-06\_T4\_Big Rivers\_StW\_Lit\_1-20-11.xls

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<b>By:</b>	Abt Associates Inc.
<b>Data Sources:</b>	see "References" tab
<b>Description:</b>	Case studies of big rivers with impairments at least partially attributable to urban stormwater
<b>Purpose:</b>	To compile documentation on the impact of urban stormwater to big rivers

Worksheet	Description
Big Rivers	Information from TMDLs and other sources (where indicated) documenting the impacts of urban stormwaters to impaired portions of large and medium-sized rivers
References	Citation for all the studies cited in "Big Rivers"

**Summary:** USGS (1990) identifies the 20 largest rivers in the United States, according to three metrics (discharge, drainage area, and length). The resultant list identifies 32 rivers total. Of these 32 rivers, at least 8 have TMDLs that identify urban stormwater runoff as a potential or known source of impairment. This spreadsheet very briefly summarizes the 8 cases, as well as an additional 5 medium to large rivers in the United States that have TMDLs identifying urban stormwater runoff as a source of impairment.

**Abbreviations:**

- ADEQ = Arizona Department of Environmental Quality
- IDEQ = Idaho Department of Environmental Quality
- KDHE = Kansas Department of Health and Environment
- LARWQCB = Los Angeles Regional Water Quality Control Board
- MDNR = Missouri Department of Natural Resources
- MS4 - Municipal separate storm sewer system
- NMED = New Mexico Environment Department
- ODEQ = Oregon Department of Environmental Quality
- TCEQ = Texas Commission on Environmental Quality
- TMDL = Total Maximum Daily Load
- U.S. EPA = United States Environmental Protection Agency
- USGS = United States Geological Survey
- WLA = waste load allocation

River	Description	Status	Impacts from Urban Stormwater	Documentation
<b><i>Largest Rivers (as identified by USGS, 1990)</i></b>				
Rio Grande, NM*	Flows 1,900 miles from Colorado into Mexico; watershed drains 336,000 mi <sup>2</sup>	Middle portion of the Rio Grande (in central New Mexico) impaired for aluminum and bacteria	Runoff from urban areas and MS4s cited as source of aluminum and bacteria contributing to impairment, although compliance with current general MS4 regulations was assumed to be sufficient to control both	NMED (2010)
Colorado River, TX*	Flows 862 miles; watershed drains 42,300 mi <sup>2</sup>	A segment of the river below E.V. Spence Reservoir is impaired for chloride and total dissolved solids	Three permitted MS4s are identified as point sources contributing to impairment, but are not considered major sources and none are required to reduced their loads to meet WLAs	TCEQ (2007)
Gila River, AZ*	Flows 649 miles; watershed drains 58,200 mi <sup>2</sup>	Two segments of the river in Arizona are impaired for E. coli	Urban stormwater runoff cited as a possible source of excessive E. coli loading; however there is little development in the relevant watershed (0.04% of area) and so development is not considered major contributor, except immediately surrounding three towns	ADEQ (2009)
Snake River, ID*	Flows 1,040 miles; watershed drains 108,000 mi <sup>2</sup>	Segments of the Hells Canyon portion (encompassing parts in Oregon and Idaho) impaired for dissolved oxygen, nutrients, sediment, mercury, pesticides, and temperature	Urban stormwater identified as a known source contributing to dissolved oxygen, nutrient, sediment, and mercury impairments	IDEQ (2004)
Missouri River, MO*	Flows 2,540 miles; watershed drains 529,000 mi <sup>2</sup>	Main stem of river impaired for chlordane and PCBs, which are found in fish tissues	Current runoff is not considered to be significant, but past runoff from urban areas (where chlordane was used for termite eradication in the 1970s and 1980s) likely contributed the current accumulation in fish	MDNR (2006)
Columbia River, OR*	Flows 1,240 miles; watershed drains 258,000 mi <sup>2</sup>	North Coast Sub-basin in Oregon, containing portions of Columbia River, impaired for temperature, bacteria, and dissolved oxygen	Although not quantified, urban stormwater is cited as a source of bacteria, and the management plan in the TMDL includes improvement of urban stormwater management	ODEQ (2003)

Willamette River, OR*	Flows 309 miles; watershed drains 11,400 mi <sup>2</sup>	Main stem of river impaired for bacteria, mercury, and temperature	Urban stormwater runoff cited as primary contributor to bacteria impairment, in addition to other sources such as sewer overflows; urban stormwater runoff was also being considered as a possible contributor to mercury impairment, but further research was underway	ODEQ (2006)
Arkansas River, Kansas*	Flows 1,460 miles from Colorado into Kansas, Oklahoma, and Arkansas; watershed drains 161,000 mi <sup>2</sup>	Portion of Arkansas River in Kansas (upstream from Haven to junction with Salt Creek) impaired for nutrients	Stormwater not discussed as main contributor to impairment, but control of urban stormwater (specifically in Hutchinson) listed as important component of TMDL implementation	KDHE (2007)
<b><i>Other Medium and Large Rivers</i></b>				
Charles River, MA	Flows 79 miles from Echo Lake to Boston Harbor; watershed drains area 311 mi <sup>2</sup>	Significantly impaired by algae and aquatic plants caused by excess nutrients, primarily phosphorus	Stormwater cited as primary contributor of excess nutrients (in addition to five municipal wastewater dischargers)	Charles River Watershed Association and Numeric Environmental Services, Inc. (2009)
Los Angeles River, CA	Flows as an open channel for 55 miles from Canoga Park neighborhood of L.A. to Long Beach Harbor; watershed covers 834 mi <sup>2</sup>	Impaired for nutrients and metals	Stormwater cited as primary contributor of metals during wet weather (other point sources are primary during dry weather); 40% of cadmium, 80% of copper, 95% of lead, and 90% of zinc	LARWQCB (2007)
Spokane River, WA	Flows 112 miles from Lake Coeur d' Alene to Columbia River; watershed encompasses 6,000 mi <sup>2</sup>	Impaired for dissolved oxygen and PCBs	Stormwater from urban areas (primarily the City of Spokane) cited as contributing to the River's dissolved oxygen impairment in addition to other point sources, although specific allocations were not ascertained; stormwater from urban areas accounts for a large proportion of PCB loadings	Washington Department of Ecology (2006); Washington Department of Ecology (2010)
San Gabriel River, CA	Flows 58 miles from San Gabriel Mountains through urbanized areas to Pacific Ocean; watershed covers 682 mi <sup>2</sup>	Impaired for metals in various reaches	Urban stormwater runoff cited as primary contributor to impairment (via vehicle break pads and wear, building materials, pesticides, erosion of paint, etc)	U.S. EPA, Region 9 (2007)

Harpeth River, TN and its tributaries	Harpeth River flows for 125 miles and drains into Cumberland River; watershed includes 1,364 miles of streams and drains 863 mi <sup>2</sup>	Impaired for sediment and habitat alteration	Wet weather sources of sediment are primarily attributed to urban stormwater (those regulated as MS4s and those not regulated as MS4s)	Tetra Tech, Inc., et al. (2002)
* indicates that descriptive information was provided by USGS (1990), which identifies and characterizes the 20 largest rivers in the United States according to discharge, drainage area, and length				

## References

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